

[0085] The printer 206 is a three-dimensional printer and may perform an operation of three-dimensional printing according to bitmaps received from the service server 204.

[0086] Here, the embodiment in which the bitmap generator 100 is a part of the service server 204 is described, however, the bitmap generator 100 is not limited by the above but may be implemented as a part of the user terminal 202 or a part of the printer 206.

[0087] FIG. 9 is a diagram illustrating a computing environment including an exemplary computing device suitable for using in the exemplary embodiments of the present disclosure.

[0088] A computing environment 300 may include a computing device 310. Generally, each element may have a different function and ability, and may additionally include components suitable for the elements. The computing device 310 may be a device (for example, the bitmap generator 100 or the service server 204) for generating bitmaps of a three-dimensional model.

[0089] The computing device 310 may include at least one processor 312, a computer-readable storage medium 314, and a bus 360. The processor 312 is connected to the bus 360, and the bus 360 connects various other components of the computing device 310, including the computer-readable storage medium 314, to the processor 312.

[0090] The processor 312 may enable the computing device 310 to operate according to the embodiment of the present disclosure described above. For example, the processor 312 may execute computer-executable commands stored in the computer-readable storage medium 314, and computer-executable commands stored in the computer-readable storage medium 314, when executed by the processor 312, may enable the computing device 310 to perform operations according to the exemplary embodiment.

[0091] The computer-readable storage medium 314 may store computer-executable commands or program codes (for example, commands included in an application 330), program data (for example, data used by the application 330), and/or another suitable type of information. The application 330 stored in the computer-readable storage medium 314 may include a certain group of commands executable by the processor 312.

[0092] A memory 316 and a storage device 318 are examples of the computer-readable storage medium 314. In the memory 316, computer-executable commands may be loaded. Further, program data may be stored in the memory 316. For example, the memory 316 may include a volatile memory such as a random access memory, a non-volatile memory, or a suitable combination thereof. In another example, the storage device 318 may include at least one detachable or fixed component for storing information. For example, the storage device 318 may include a hard disk, a flash memory, a magnetic disk, an optical disk, other types of media which are accessible by the computing device 310 and in which information may be stored, or a suitable combination thereof.

[0093] Further, the computing device 310 may include at least one input/output interface 320 which provides interface for at least one input/output device 370. The input/output interface 320 may be connected to the bus 360. The input/output device 370 may be connected to the computing device 310 (other components of the computing device 310) through the input/output interface 320. The input/output device 370 may include input devices such as a pointing

device, a keyboard, a touch input device, a sound input device, a sensor device and/or an imaging device, and/or output devices such as a display device, a printer, a speaker and/or a network card.

[0094] Meanwhile, an exemplary embodiment of the present disclosure may include computer-readable storage media including a program for performing a process described in the specification in the computer. The computer-readable storage media may include program commands, a local data file, and a local data structure as a single form or combination thereof. The computer-readable storage media may be particularly designed and constructed for the present disclosure. Examples of the computer-readable storage media may include magnetic media such as a hard disk, a floppy disk and a magnetic tape, optical recording media such as CD-ROM and DVD, magneto-optical media such as a floptical disk, and a hardware device such as a ROM, RAM and a flash memory, which have special structure to store and execute program commands. Examples of program commands may include not only machine codes made by a compiler but also high level language codes executable by the computer using an interpreter.

[0095] According to exemplary embodiments, a three-dimensional model is divided in a direction parallel with an output direction and a sub model includes information on horizontal stacked planes, and therefore a slicing operation may be performed through parallel processing with respect to a plurality of sub models and time consumed in the slicing operation can be reduced, and in addition, a support material region can also be easily obtained. Further, a distribution of a sub bitmap generation operation is readjusted based on a processing degree of the sub bitmap generation operation, and therefore the slicing operation can be processed more efficiently, and time required for the slicing operation can be further reduced.

[0096] While the representative exemplary embodiments of the present disclosure have been described in detail, a person skilled in the art to which the present disclosure pertains will understand that several variations can be made to the exemplary embodiments without departing from the scope of the present disclosure. Therefore, the scope of the present disclosure should not be limited to the described exemplary embodiments, and should be determined by the claims to be described below and their equivalents.

What is claimed is:

1. A bitmap generator for generating bitmaps of a three-dimensional model for use by a three-dimensional printer, comprising:

- a model divider configured to divide the three-dimensional model into a plurality of sub models, such that an interface between adjacent sub models extends in a direction parallel with an output direction of the three-dimensional printer;
- a plurality of sub bitmap generators, each configured to generate a sub bitmap of a plane of a sub model from among the plurality of sub models, wherein the plane is perpendicular to the output direction;
- an operation distributor configured to transfer and distribute each of the plurality of sub models to a respective one of the plurality of sub bitmap generators, such that a plurality of sub bitmaps are generated concurrently; and